

## CLAIMS

What is claimed is:

1. A charging voltage controller of an image forming apparatus comprising:  
a charging roller charging a photoconductive drum with a predetermined charging voltage;  
a high voltage supply unit supplying the predetermined charging voltage to the charging roller;  
an electric current detecting unit detecting an electrical current flowing to the charging roller; and  
a control unit supplying first and second test voltages of different levels to the charging roller, determining a first reference voltage to be applied to the charging roller based on data from the electric current detecting unit outputted in response to the first test voltage, calculating slope data based on the electrical current data detected from the electric current detecting unit in response to the first and second test voltages, and determining the charging voltage to be applied to the charging roller as a sum of the first reference voltage and a preset offset voltage that corresponds to the slope data.
2. The charging voltage controller of claim 1, further comprising:  
a storage unit storing a first lookup table and a second lookup table, wherein the first lookup table stores an environmental factor set in correspondence with the data outputted from the electric current detecting unit in response to the first and second test voltages, and the first reference voltage set in correspondence with the environmental factor, and the second lookup table stores offset voltage data set in correspondence with the slope data.
3. The charging voltage controller of claim 1, wherein the controller supplies the high voltage supply unit with the first test voltage before supplying the second test voltage to the photoconductive medium.
4. The charging voltage controller of claim 3, wherein the first test voltage is greater than the second test voltage.
5. The charging voltage controller of claim 2, wherein the environment factors comprise:

one or a combination of humidity, temperature, a thickness, and a surface condition of the photoconductive medium.

6. The charging voltage controller of claim 1, wherein the high voltage supply unit comprises:

a transformer having a primary winding coupled between a potential and the controller; and a secondary winding having a first end coupled to the charging roller and a second end coupled to the current detecting unit; and

a rectifying unit rectifying a voltage disposed on the secondary winding of the transformer.

7. The charging voltage controller of claim 1, further comprising:

a pulse width modulating unit coupled between the controller and the primary winding to output a signal having a duty ratio according to a control signal of the controller; and

a switching unit coupled between the pulse width modulating unit and the primary winding of the high voltage supply unit to supply the first and second test voltage, and the charging voltage to the high voltage supply unit according to the signal having the duty ratio.

8. The charging voltage controller of claim 1, wherein the current detecting unit comprises:

a first resistor coupled to the charging roller;

a second resistor coupled between the first resistor and a potential; and

a third resistor coupled between a second potential and a junction of the first and second transistor.

9. The charging voltage controller of claim 1, further comprising:

an A/D converting unit coupled between the controller and the charging roller

10. A method of a charging voltage controller of an image forming apparatus having a charging roller charging a photoconductive medium with a charging voltage, comprising:

supplying first and second test voltages of different levels to the charging roller charging a photoconductive medium;

detecting the first and second currents flowing the charging roller when the first and second test voltages are applied to the charging roller;

calculating slope data based on a first reference voltage generated from the first current, and also based on the first and second currents; and

determining the charging voltage to be applied to the charging roller as a sum of the first reference voltage and a preset offset voltage that corresponds to the slope data.

11. The method of claim 10, wherein the supplying of the supply voltage to the high voltage supply comprises:

supplying the high voltage supply unit with the first test voltage before supplying the second test voltage to the photoconductive medium.

12. The method of claim 11, wherein the first test voltage is greater than the second test voltage.

13. The method of claim 10, wherein the first reference voltage is calculated based on an environment factor and the first current.

14. The method of claim 13, wherein the environment factors comprise:  
one or a combination of humidity, temperature, a thickness, and a surface condition of the photoconductive medium.